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MVDDS/DiY Multipoint Data Video Distribution System

MVDS2/DiY



User Manual

Includes install, configuration and trouble shooting information for the broadband Broadcast outdoor radio.

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About This Manual

This manual includes install, configuration and trouble shooting for the KU Band SSPA radio. It can help you in avoiding the unforeseen problems and use the outdoor radio correctly.

Technical Support

If you have difficulty resolving the problem while installing or using the radio, Please contact the supplier for support.

Summary.

SUMMARY	2
1 FIGURE INDEX	2
2 GENERAL DESCRIPTION	3
3 INSTALLATION	3
4 TECHNICAL SPECIFICATIONS	4
4.1 GENERAL SPECIFICATIONS.....	4
4.2 MECHANICAL SPECIFICATIONS.....	4
4.3 SYSTEM SPECIFICATIONS.....	4
5 BLOCK DIAGRAMS	6
5.1 STANDARD POWER (6W) 13.5-14.5 GHz.....	6
5.2 STANDARD POWER (6W) 13.5-14.5 GHz WITH DRIVER 4 W.....	7
5.3 STANDARD POWER (8W) 11.70-12.25/12.20-12.75 GHz.....	8
5.4 STANDARD POWER (8W) 10.70-11.10/11.10-11.50/11.50-11.90 GHz.....	9
5.5 HIGH POWER (20W) 10.70-12.20 GHz.....	10
5.6 HIGH POWER (25W) 13.50-14.50 GHz.....	11
6 WEB INTERFACE	12
6.1 STATUS.....	13
6.2 CONFIG.....	14
6.3 NETWORK.....	15
6.4 FAULT.....	16
7 MECHANICS AND CONNECTORS	17

1 Figure Index.

FIGURE 1: BLOCK DIAGRAM STANDARD POWER (6W) 13.5-14.5 GHz.....	6
FIGURE 2: BLOCK DIAGRAM STANDARD POWER (6W) 13.5-14.5 GHz WITH DRIVER 4 W.....	7
FIGURE 3: BLOCK DIAGRAM STANDARD POWER (8W) 11.70-12.25/12.20-12.75 GHz.....	8
FIGURE 4: BLOCK DIAGRAM STANDARD POWER (8W) 10.70-11.10/11.10-11.50/11.50-11.90 GHz.....	9
FIGURE 5: BLOCK DIAGRAM HIGH POWER (20W) 10.70-12.20 GHz.....	10
FIGURE 6: BLOCK DIAGRAM HIGH POWER (25W) 13.50-14.50 GHz.....	11
FIGURE 7: WEB INTERFACE HOME PAGE.....	12
FIGURE 8: SYSTEM INFO.....	13
FIGURE 9: L-BAND INPUT STATUS.....	13
FIGURE 10: KU CONVERTER STATUS.....	13
FIGURE 11: POWER AMPLIFIER STATUS.....	14
FIGURE 12: WEB INTERFACE CONFIG PAGE.....	14
FIGURE 13: WEB INTERFACE NETWORK PAGE.....	15
FIGURE 14: WEB INTERFACE ALARM PAGE.....	16
FIGURE 15: CONNECTORS MVDS2.....	17

2 General Description.

MVDS2 is the new version of Elber Multichannel audio/video distribution system; it has been designed to transmit combined DVB-S/S2 carriers or full satellite transponders at Ku-band frequencies.

MVDS2 is a fully weatherproof IP65 housing suitable for outdoor installations in harsh environments, available in two version, standard or high power; the standard version hosts GaAs Fet transistor as final stage, while the high power utilizes GaN FET. GaN technology achieves higher efficiency and superior performances in terms of linearity compared to the GaAs.

The system is protected with automatic squelch of final stages in case of critical temperature or power overload.

The management and monitoring of the equipment can be achieved through a very easy and intuitive web interface.

3 Installation.

- Unpack the equipment and check first of all check if there are any damages due to the transport.
- The box should contain:
 - The MVDS2
 - One DC supply cable
 - One Cable for Ethernet communication
- Install the equipment on a mast.
- The equipment must be correctly grounded, to guarantee a secure functioning.
- Connect to the correct power voltage reading the information on the manual or on the label attached to each equipment, containing the serial number.
- Connect the network cable to the plug. The last used configuration will be loaded.
- Setup the equipment according to the needs consulting the user manual.

4 Technical Specifications.

4.1 General specifications.

Operating temperature range	-10°C ÷ 55°C
Relative Humidity	0 ÷ 95°C condensing
Power supply	22 ÷ 28 V (2 pin connector)
Maximum Power consumption	150 W

4.2 Mechanical specifications.

Width	128.5 mm
Height	210 mm
Depth	322.5 mm
Weight	< 12 Kg

4.3 System specifications.

L-Band input connector	N (F) 50 ohm
VSWR RF In	1.3:1
RF output connector	WR75 flange PBR120 50 ohm
VSWR RF Out	1.3:1
Output Frequency range	14.0-14.5 GHz 13.5-14.0 GHz 12.20-12.75 GHz 11.70-12.25 GHz 11.50-11.90 GHz 11.10-11.50 GHz 10.70-11.10 GHz
Output Power @ 1 dB c.o.	44.0 dBm (25W) high power option on 14.0-14.5 GHz 44.0 dBm (25W) high power option on 13.5-14.0 GHz 43.0 dBm (20W) high power option on 10.70-12.25 GHz 37.5 dbm (6W) standard power option on 14.0-14.5 GHz 37.5 dbm (6W) standard power option on 13.5-14.0 GHz 39.0 dBm (8W) standard power option on 12.20-12.75 GHz 39.0 dBm (8W) standard power option on 11.70-12.25 GHz 39.0 dBm (8W) standard power option on 11.50-11.90 GHz 39.0 dBm (8W) standard power option on 11.10-11.50 GHz 39.0 dBm (8W) standard power option on 10.70-11.10 GHz
P linear (single carrier) PLIN=output power at specified spectral regrowth@1.0*symbol rate for QPSK/8PSK	40.0 dBm high power option on 14.00-14.50 GHz 40.0 dBm high power option on 13.50-14.00 GHz 39.0 dBm high power option on 10.70-12.25 GHz 33.5 dbm standard power option on 14.00-14.50 GHz 33.5 dbm standard power option on 13.50-14.00 GHz 35.0 dBm standard power option on 12.20-12.75 GHz 35.0 dBm standard power option on 11.70-12.25 GHz 35.0 dBm standard power option on 11.50-11.90 GHz 35.0 dBm standard power option on 11.10-11.50 GHz 35.0 dBm standard power option on 10.70-11.10 GHz
Gain (@ 0dB attenuation)	78.0 dB ± 2dB High power option 50.0 dB ± 2dB Standard power option
Gain regulation	20.0 dB in 0.1dB
Gain flatness	± 0.75 dB over any 40Mhz band ± 2.0 dB full band
Gain variation over temperature	± 1.0 dB max
Gain variation over temperature (open loop)	± 1.5 dB max
Gain variation over temperature	± 0.3 dB

(with AGC)	
Spectral Regrowth	< -30 dBc (@1.0 x Symbol Rate in QPSK/8PSK)
Third order IMD (two Signal 5 MHz apart @ Plin)	< -25 dBc
Spurious option	<-55 dBc @ PLIN
UP CONVERTER (OPTION)	
L-Band input frequency range	50-1450 MHz (standard) 950-1700 MHz (extended)
Local Oscillator	12.58 or 13.05 GHz @14.00-14.50 GHz 12.08 or 12.55 GHz @13.50-14.00 GHz 10.60 or 11.40 GHz @12.20-12.75 GHz 10.28 or 10.75 GHz @11.70-12.25 GHz 10.08 or 10.55 GHz @11.50-11.90 GHz 9.68 or 10.15 GHz @11.10-11.50 GHz 9.28 or 9.75 GHz @10.70-11.10 GHz
Input AGC Range	0 ± -25 dBm
Phase noise of BUC	- 70dBc/Hz @ 100 Hz - 90dBc/Hz @ 1 KHz - 98dBc/Hz @ 10 KHz -100dBc/Hz @ 100 KHz -120dBc/Hz @ 1 MHz
Controls	RS-485 RS-232 Ethernet Embedded Web Server

5 Block Diagrams.

5.1 Standard Power (6W) 13.5-14.5 GHz.

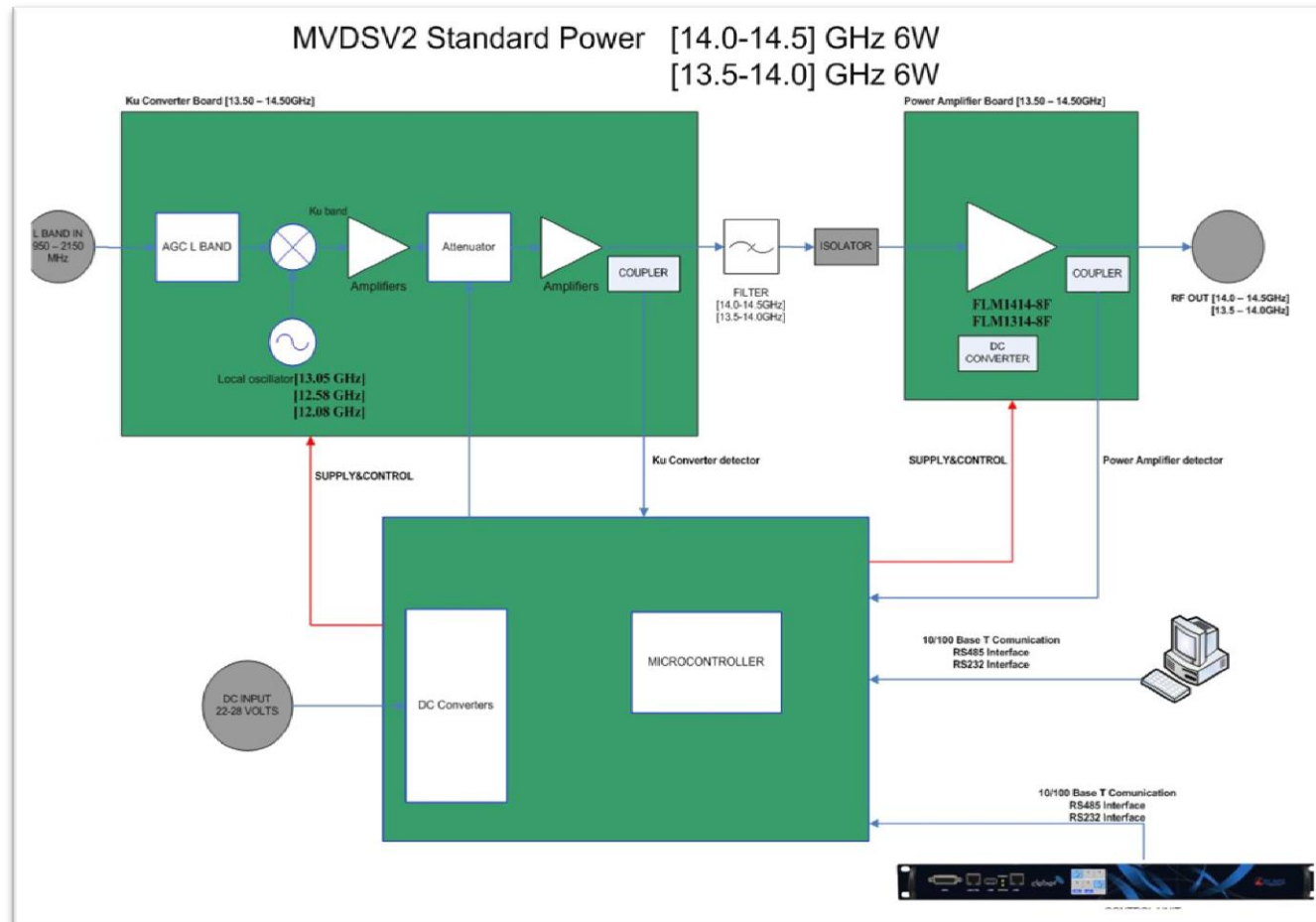


FIGURE 1: BLOCK DIAGRAM STANDARD POWER (6W) 13.5-14.5 GHz.

5.2 Standard Power (6W) 13.5-14.5 GHz With Driver 4 W.

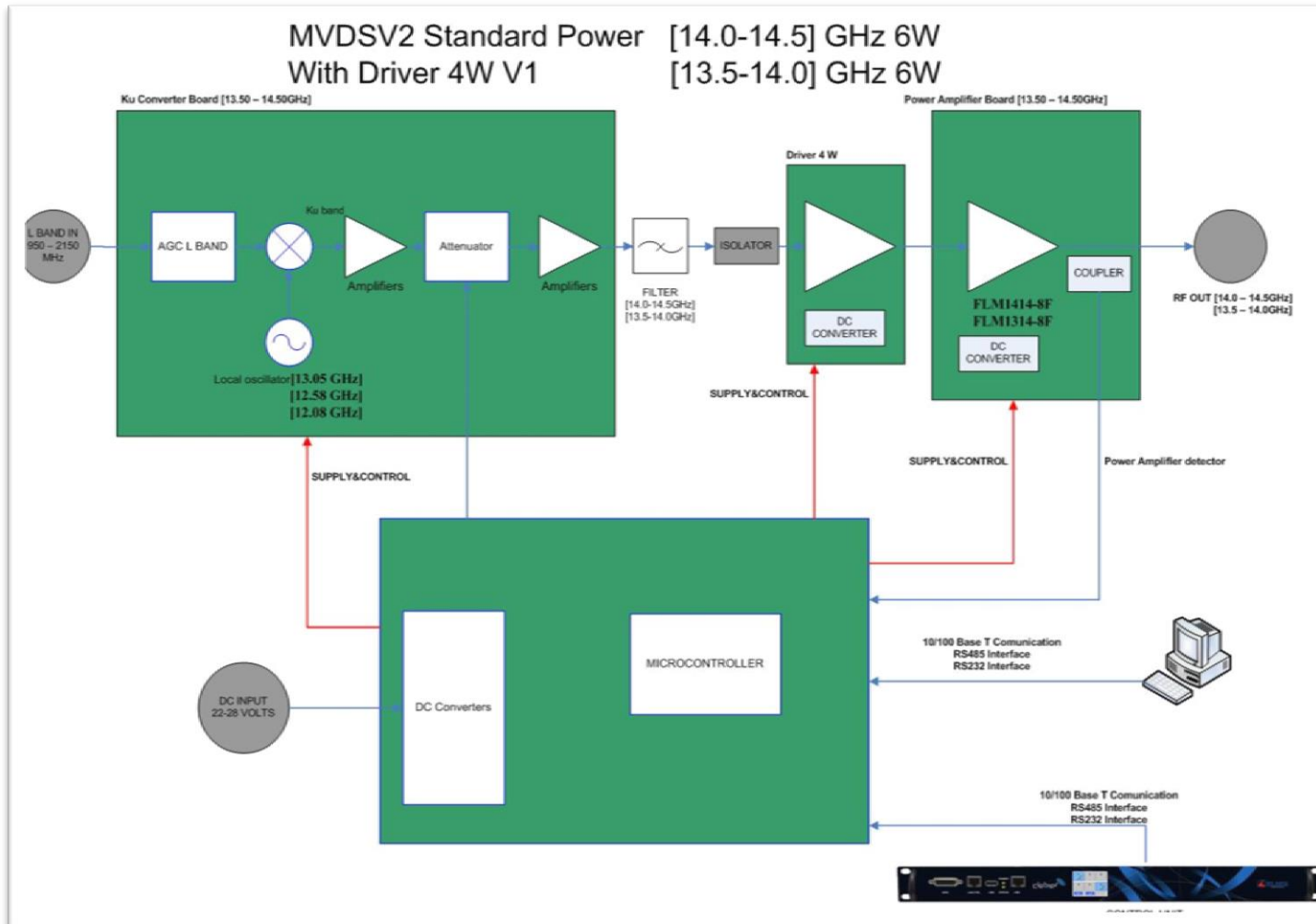


FIGURE 2: BLOCK DIAGRAM STANDARD POWER (6W) 13.5-14.5 GHz WITH DRIVER 4 W.

5.3 Standard Power (8W) 11.70-12.25/12.20-12.75 GHz.

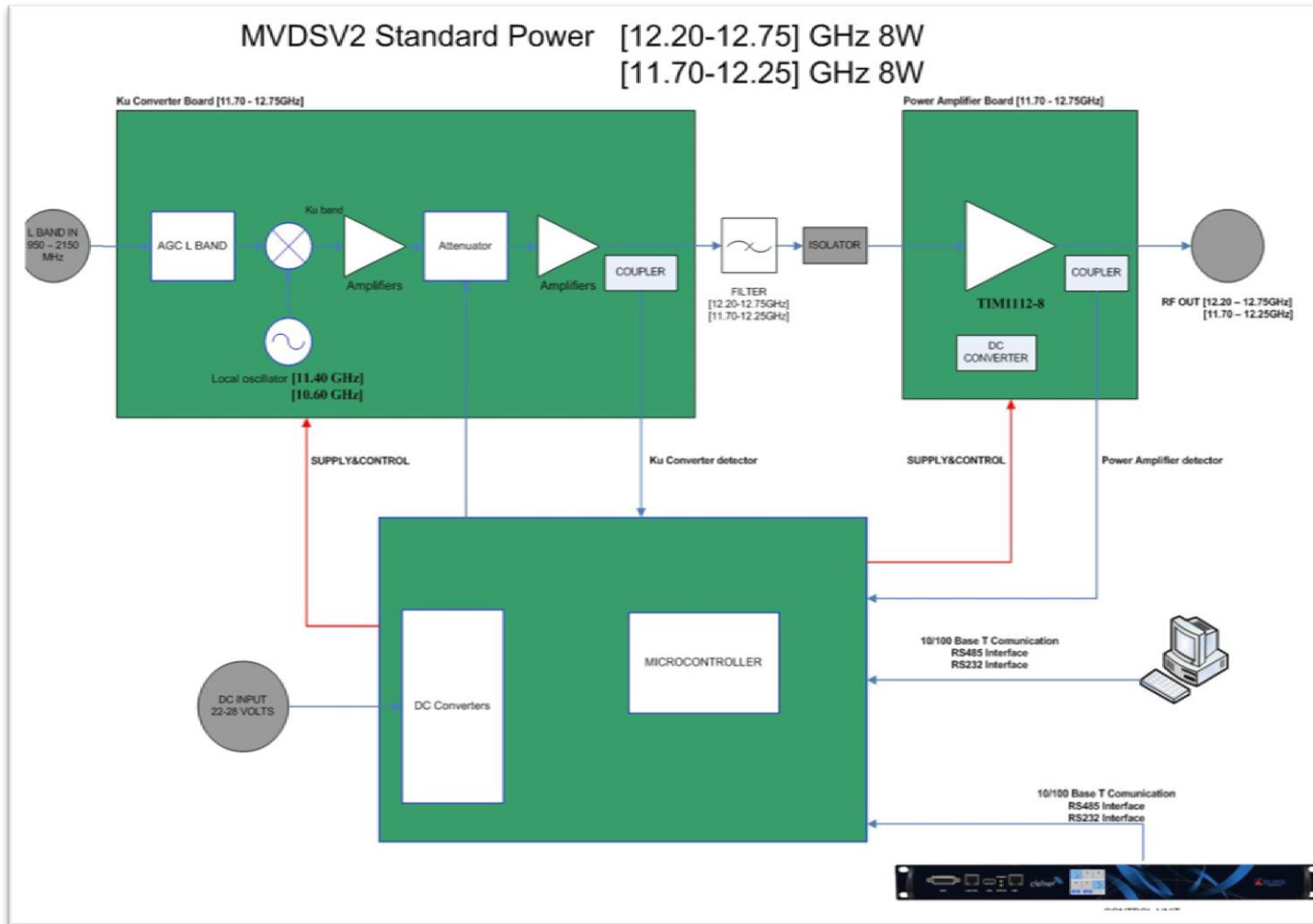


FIGURE 3: BLOCK DIAGRAM STANDARD POWER (8W) 11.70-12.25/12.20-12.75 GHz.

5.4 Standard Power (8W) 10.70-11.10/11.10-11.50/11.50-11.90 GHz.

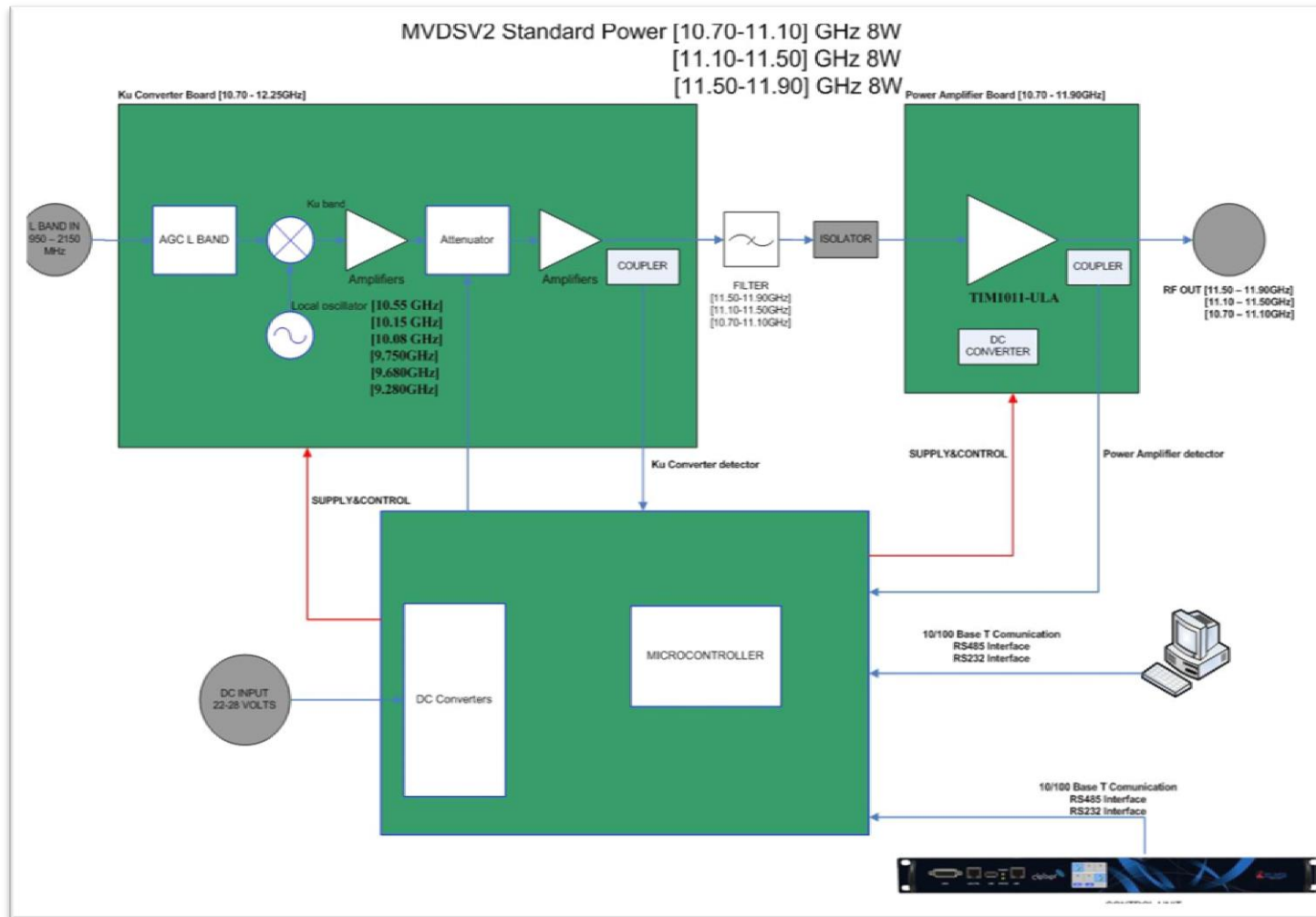


FIGURE 4: BLOCK DIAGRAM STANDARD POWER (8W) 10.70-11.10/11.10-11.50/11.50-11.90 GHz.

5.5 High Power (20W) 10.70-12.20 GHz.

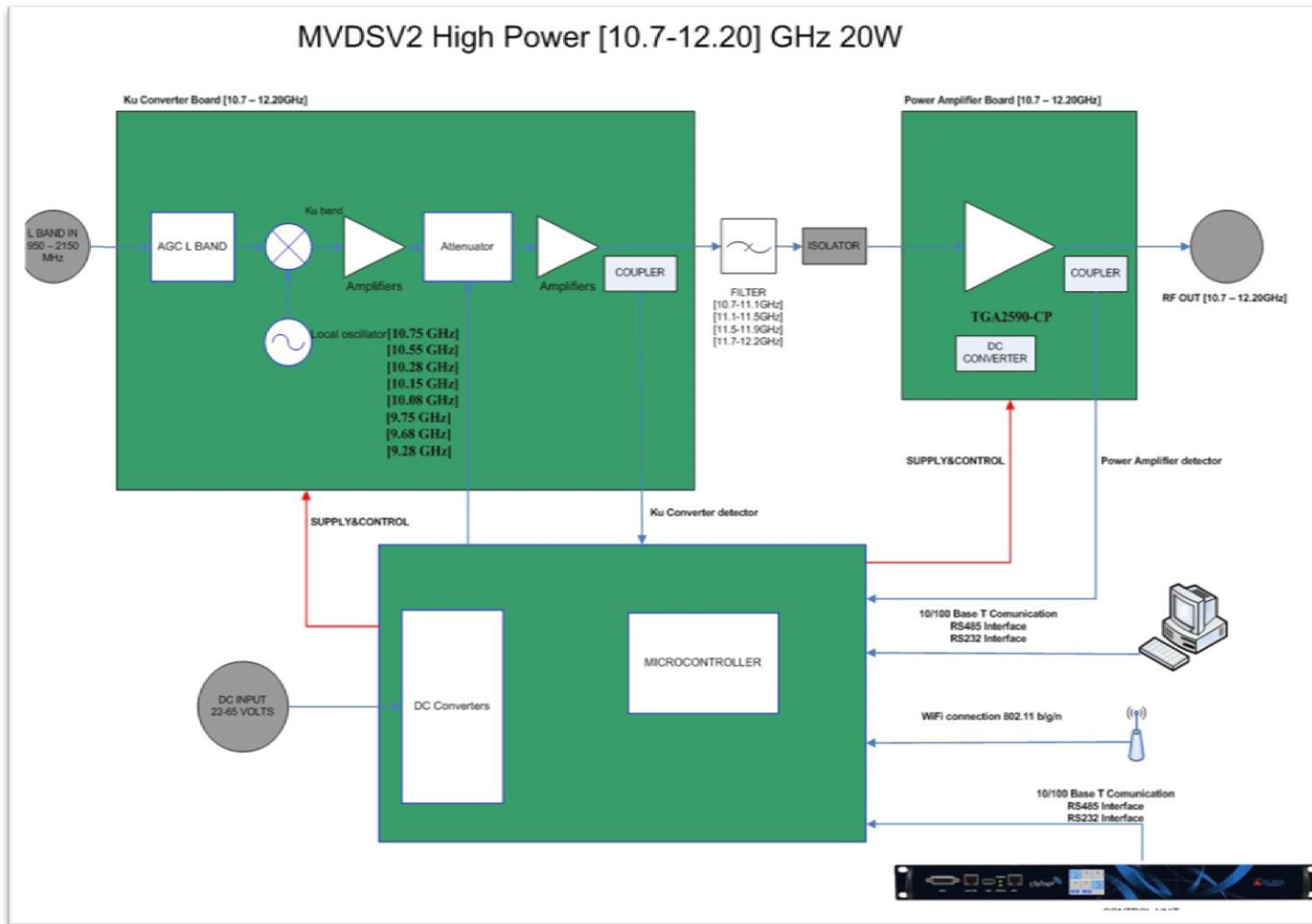


FIGURE 5: BLOCK DIAGRAM HIGH POWER (20W) 10.70-12.20 GHz.

5.6 High Power (25W) 13.50-14.50 GHz.

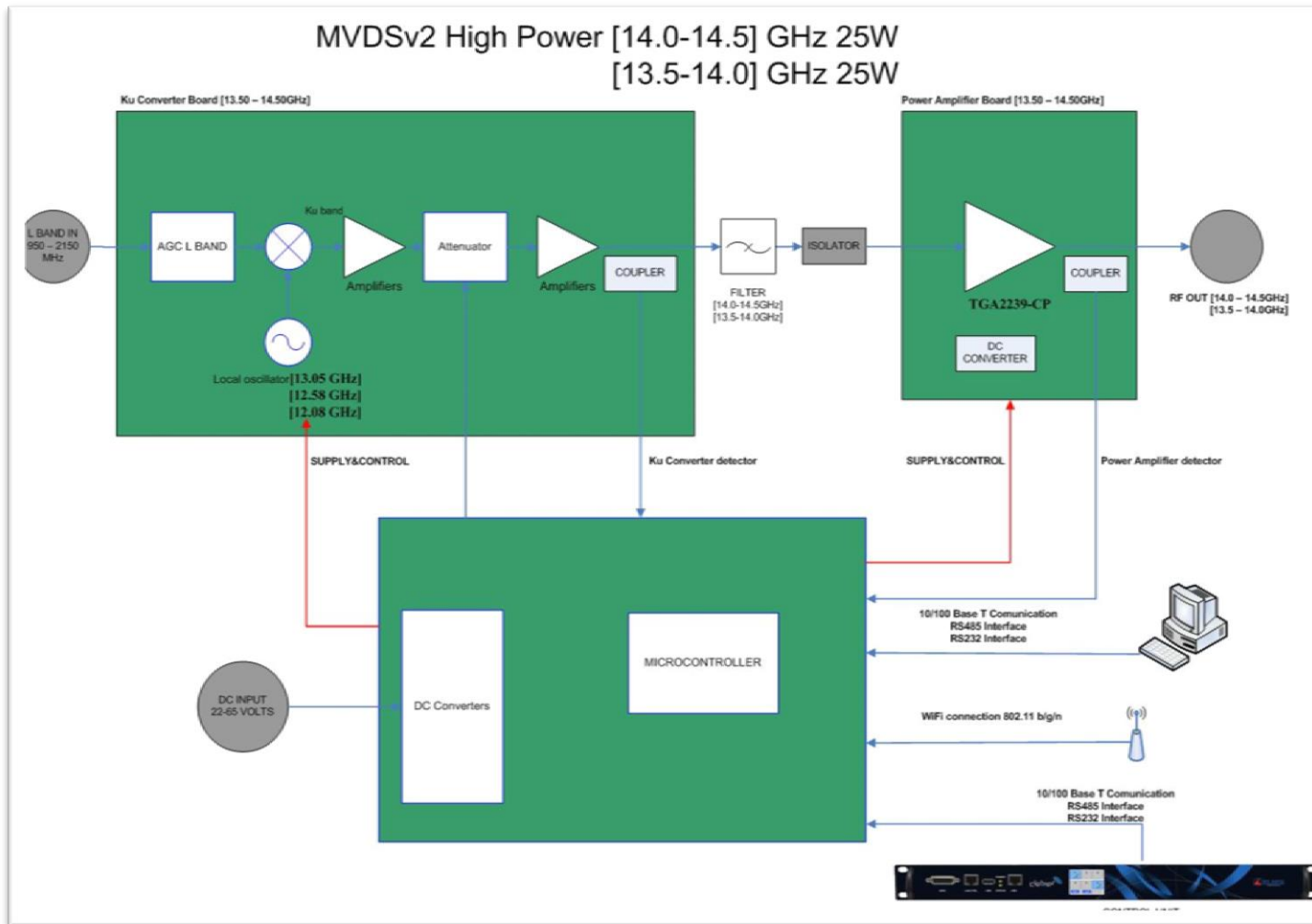


FIGURE 6: BLOCK DIAGRAM HIGH POWER (25W) 13.50-14.50 GHz

6 Web interface.

MVDS2 is equipped with a WEB interface for an easier and intuitive monitoring and equipment configuration. The connection to Web server can be achieved through dedicated cable directly to the outdoor unit.

With a very common *Web browser* (like Internet Explorer, Mozilla Firefox, Google Chrome, Opera, Safari...) it is possible to check equipment status and verify performances even remotely simply writing in the address bar the IP address of the equipment. In order to check the IP address, please refer to par.

Important Note: Default IP address is 192.168.10.150.

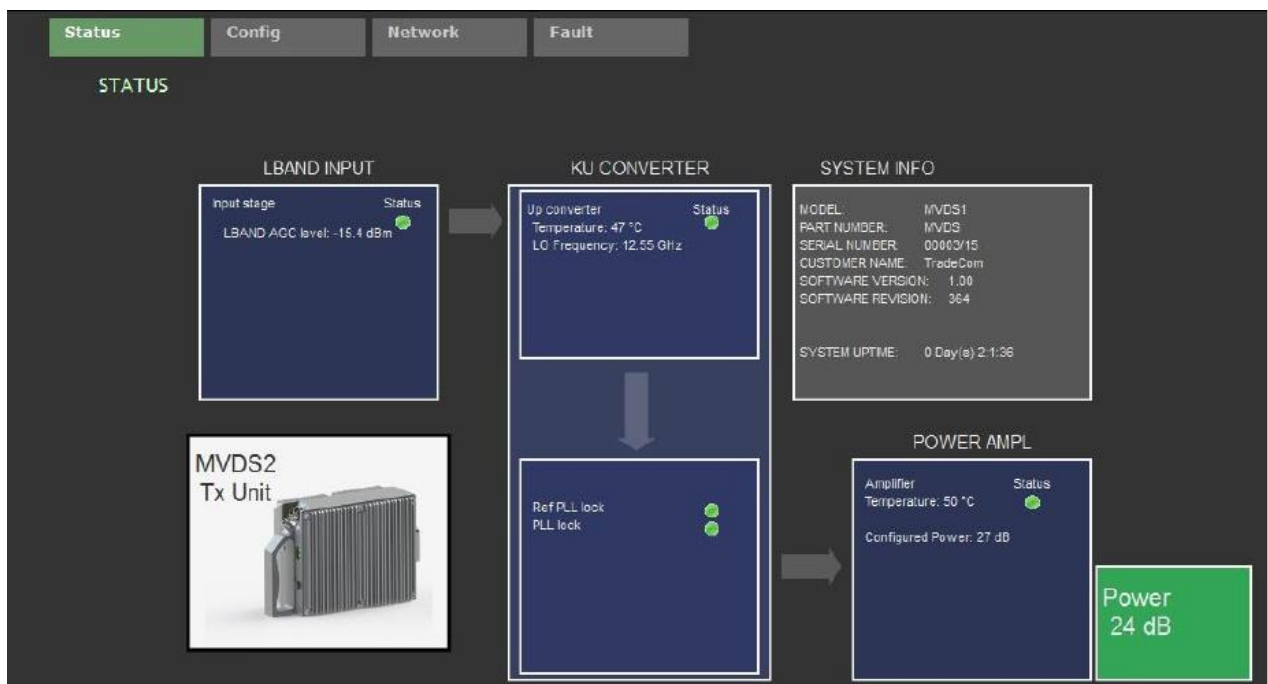


FIGURE 7: WEB INTERFACE HOME PAGE

Figure 7 shows the home page of the Web interface, which by default is the Status Page.

In the upper part, the user can select the desired page between:

- 1) Status
- 2) Config
- 3) Network
- 4) Fault

6.1 Status.

The status page is composed of 6 blocks; in the right part, the grey box includes all system information, including S/N, P/N and firmware versions.



FIGURE 8: SYSTEM INFO

The blue boxes shows graphically the different parts composing the system, that are:

- L-Band input
- KU converter
- Power Amplifier

For each part, a led icon resumes the sub-part status (green = ok; red = alarm; yellow = warning).



FIGURE 9: L-BAND INPUT STATUS

For the L-band stage, it's available the input level measurement in dBm as shown in Figure 9.



FIGURE 10: KU CONVERTER STATUS

The Ku converter board presents following measurements and/or information:

1. Temperature
2. Indication of oscillator frequency
3. Reference locking status
4. PLL Lock status

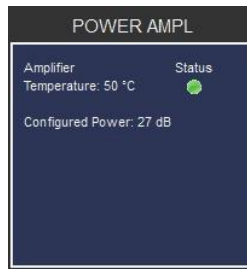


FIGURE 11: POWER AMPLIFIER STATUS

The Power Amplifier board presents following measurements and/or information:

1. Temperature
2. Configured output power

6.2 Config.

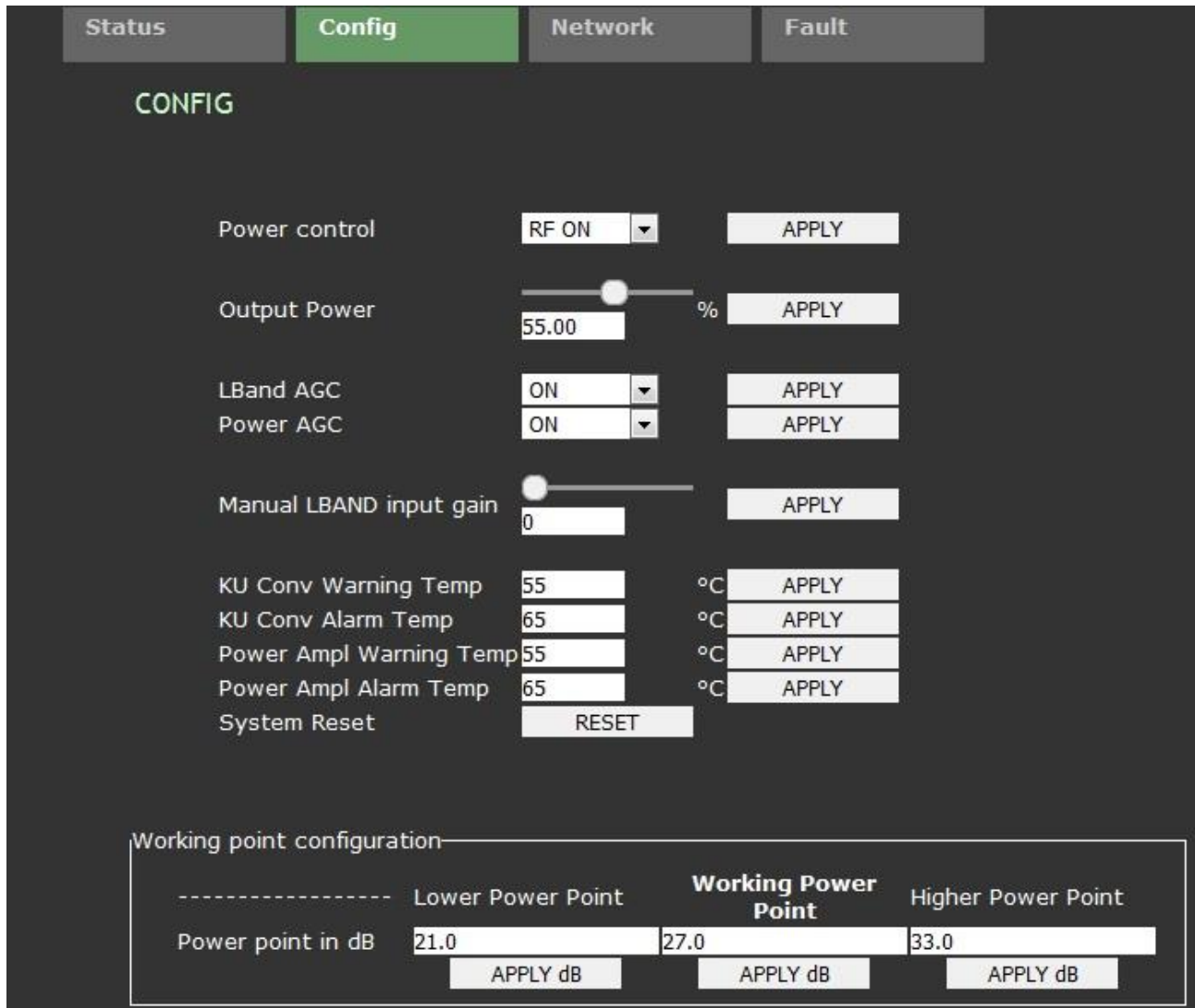


FIGURE 12: WEB INTERFACE CONFIG PAGE.

To modify any field shown in Figure 12 it is necessary to click on the Apply button besides to validate. Hereunder the list of field and related description.

Field	Description
Power Control	Let the user enable or disable the power amplifier,

	choosing between RF ON and RF OFF
Output Power	Let the user set the output power in % of the maximum power
LBand AGC	Let the user enable/disable the input Automatic Gain Control (cable loss compensation)
Power AGC	Let the user enable/disable the output Automatic Gain Control (compensating temperature and input level variations)
Manual L-Band input gain	Let the user set manually the input gain (LBand AGC off)
KU conv. Warning Temp	Let the user set the temperature warning threshold
KU conv. Alarm Temp	Let the user set the temperature alarm threshold
Power Ampl. Warning Temp	Let the user set the power amplifier temperature warning threshold
Power Ampl. Alarm Temp	Let the user set the power amplifier temperature alarm threshold
System Reset	Let the user reset the unit
Power point in dB	Let the user set the power out between a Lower threshold and a Higher threshold, after intermodulation check and power fine tuning.

6.3 Network.

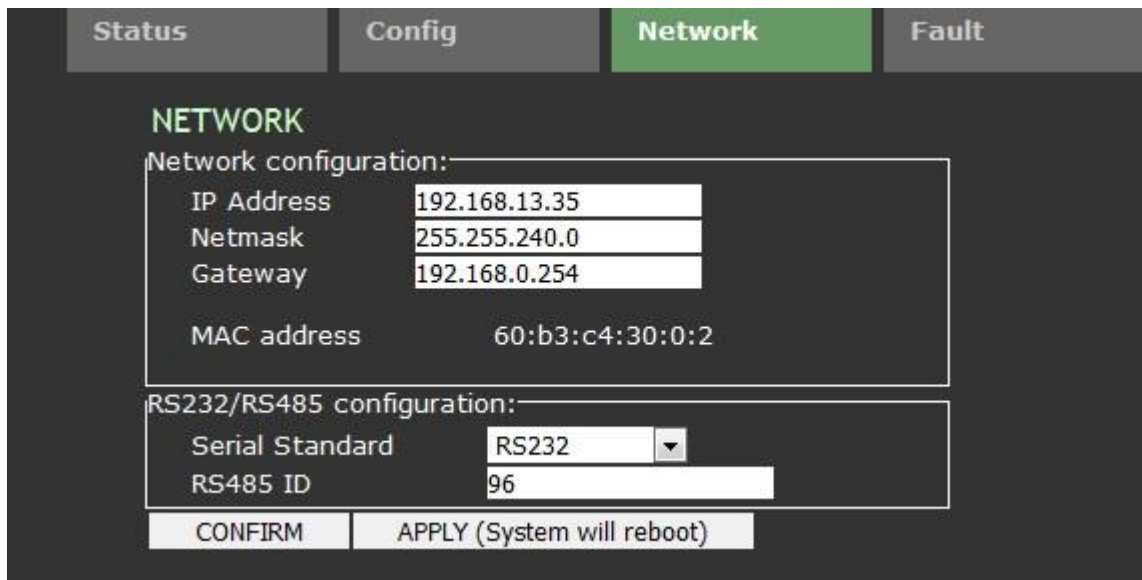


FIGURE 13: WEB INTERFACE NETWORK PAGE.

Field	Description
IP Address	Let the user set the IP address of the equipment
Netmask	Let the user set the IP subnet mask of the equipment
Gateway	Let the user set the Gateway IP address of the equipment
MAC Address	Shows the equipment MAC address
Serial standard	Let the user configure the serial configuration between RS232 and RS485
RS485 ID	Let the user set the RS485 address of the equipment
Baud rate	Let the user set the RS232 baud rate.

To confirm modifications it is necessary to push on “CONFIRM” button and then “APPLY” to validate; upon this operation the system will reboot causing transmission interruption.

6.4 Fault.

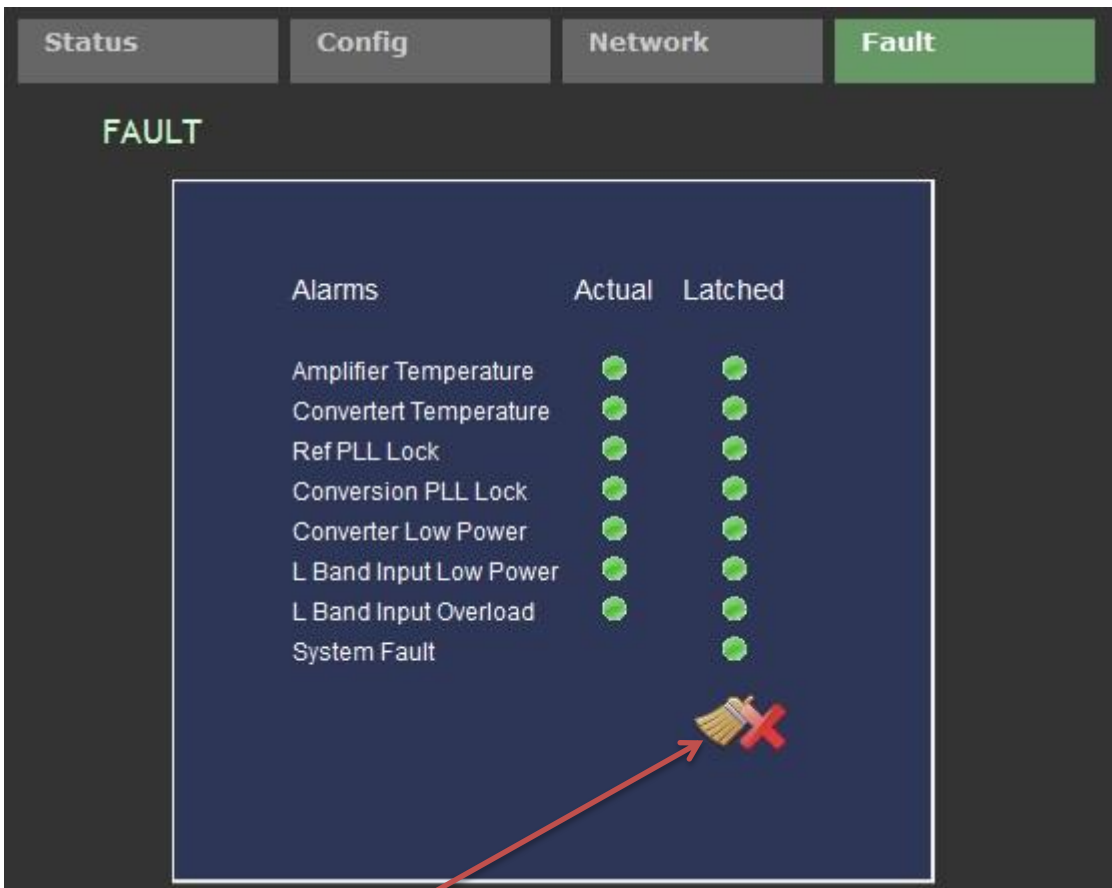


FIGURE 14: WEB INTERFACE ALARM PAGE.

Figure 14 shows alarms of the equipment, divided in two columns, the actual and the historical. Historic alarms can be reset clicking here.

7 Mechanics and connectors.

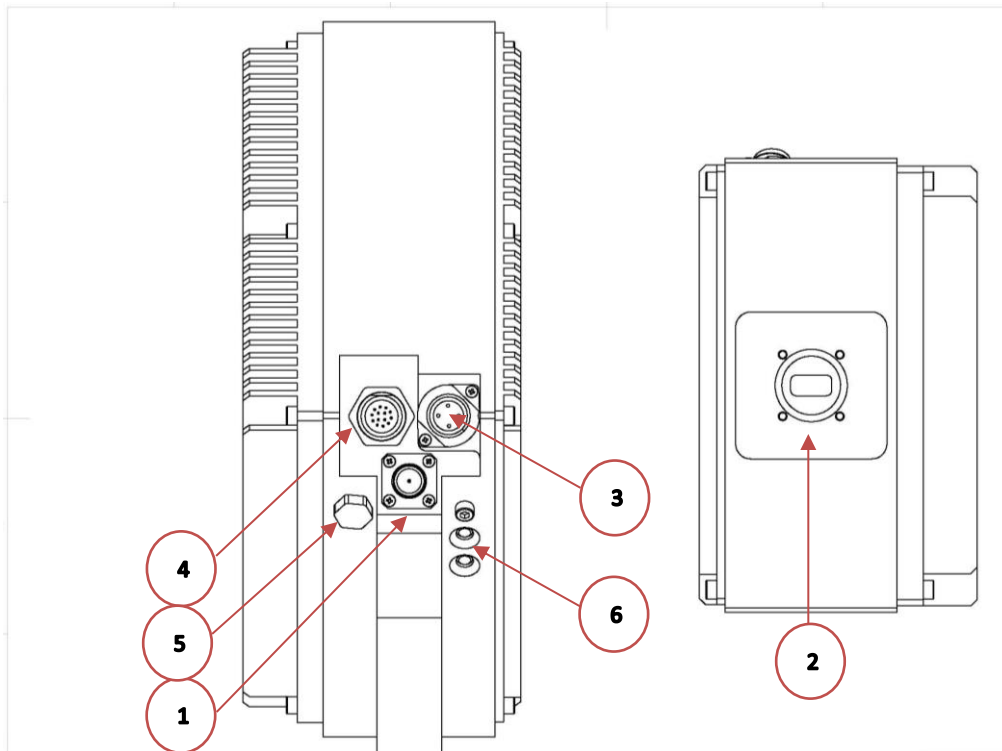


FIGURE 15: CONNECTORS MVDS2

ID	Description	Function
1	RF IN	RF input connector N(f) type
2	RF OUT	Output waveguide flange WR75 (PBR120)
3	DC IN	Supply Connector 4 pin Hirschmann Code: 932322100
4	M&Control	Control Connector 14 pin Amphenol Code: MS3114A12-14P
5	Valve Gore	Protection valve
6	LED	Status & Ethernet Activity Led